Dual Output Plug-in Signal Conditioners W-UNIT

FREQUENCY TRANSMITTER
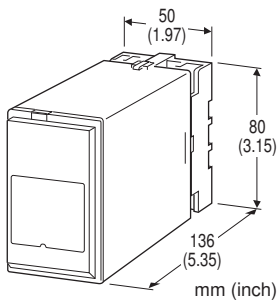(field-programmable; built-in excitation)

Functions & Features
• Converts the output from a pulse-type transducer into a standard process signal
• Built-in excitation
• Field-selectable input type and range: Open collector, mechanical contact, voltage pulse or two-wire current pulse
• High-density mounting

Typical Applications
• Positive displacement flowmeters, turbine flowmeters and vortex flowmeters
• Measuring rotation speed of a machine generating dry contact signals

```
      50
    (1.97)

              80
            (3.15)

      136
    (5.35)
    mm (inch)
```

MODEL: WJPAD2-[1][2][3]-[4][5]

ORDERING INFORMATION
• Code number: WJPAD2-[1][2][3]-[4][5]
Specify a code from below for each of [1] through [5].
  (e.g. WJPAD2-7A6-K/Q)
• Special output ranges (For codes Z & 0)
• Use Ordering Information Sheet (No. ESU-2275). Factory setting (indicated below) will be used if not otherwise specified.
• Specify the specification for option code /Q
  (e.g. /C01/S01)
Note: When the user requires a current and a voltage output, specify the current to be the Output 1 which allows a greater load.

■FACTORY DEFAULT SETTING

Input type	Open collector
Pulse sensing	DC coupled
Pulse amplitude	----
DC offset	----
Input zero frequency	0 Hz
Input span frequency	1000 Hz
Low-end cutout	-15.00 %
Non-uniform pulse compensation	1 (no compensation)
Alarm mode	High alarm
Alarm setpoint	100.00 %
Alarm deadband	1.00 %
Alarm on delay time	3.0 sec.
Linearization	Without

INPUT – Field-selectable
Open collector
Mechanical contact
Voltage pulse
Two-wire current pulse

[1] EXCITATION
1: 5 V DC @ 120 mA
4: 12 V DC @ 60 mA
7: 24 V DC @ 25 mA

[2] OUTPUT 1
Current
A: 4 – 20 mA DC (Load resistance 600 Ω max.)
B: 2 – 10 mA DC (Load resistance 1200 Ω max.)
C: 1 – 5 mA DC (Load resistance 2400 Ω max.)
D: 0 – 20 mA DC (Load resistance 600 Ω max.)
E: 0 – 16 mA DC (Load resistance 750 Ω max.)
F: 0 – 10 mA DC (Load resistance 1200 Ω max.)
G: 0 – 1 mA DC (Load resistance 12 kΩ max.)
Z: Specify current (See OUTPUT SPECIFICATIONS)*
Voltage
1: 0 – 10 mV DC (Load resistance 10 kΩ min.)
2: 0 – 100 mV DC (Load resistance 100 kΩ min.)
3: 0 – 1 V DC (Load resistance 1000 Ω min.)
4: 0 – 10 V DC (Load resistance 10 kΩ min.)
5: 0 – 5 V DC (Load resistance 5000 Ω min.)
6: 1 – 5 V DC (Load resistance 5000 Ω min.)
4W: -10 – +10 V DC (Load resistance 10 kΩ min.)
5W: -5 – +5 V DC (Load resistance 5000 Ω min.)
0: Specify voltage (See OUTPUT SPECIFICATIONS)*

[3] OUTPUT 2

Current

A: 4 – 20 mA DC (Load resistance 350 Ω max.)
B: 2 – 10 mA DC (Load resistance 700 Ω max.)
C: 1 – 5 mA DC (Load resistance 1400 Ω max.)
D: 0 – 20 mA DC (Load resistance 350 Ω max.)
E: 0 – 16 mA DC(Load resistance 430 Ω max.)
F: 0 – 10 mA DC (Load resistance 700 Ω max.)
G: 0 – 1 mA DC (Load resistance 7000 Ω max.)
Z: Specify current (See OUTPUT SPECIFICATIONS)*
Voltage
Same range availability as Output 1

* For specify voltage and current, specify same code and output to output 1 and output 2. Consult M-System when different output codes are combined and specified.

[4] POWER INPUT

AC Power
K: 85 – 132 V AC
DC Power
S: 12 V DC (under development)
R: 24 V DC
V: 48 V DC
P: 110 V DC

[5] OPTIONS

blank: none
/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating
TERMINAL SCREW MATERIAL
/S01: Stainless steel

RELATED PRODUCTS

• Programming Unit (model: PU-2x)
• PC configurator software (model: JXCON)
Downloadable at M-System's web site.
A dedicated cable is required to connect the module to the PC. Please refer to the internet software download site or the users manual for the PC configurator for applicable cable types.

GENERAL SPECIFICATIONS

Construction: Plug-in
Connection: M3.5 screw terminals

Screw terminal: Chromated steel (standard) or stainless steel
Housing material: Flame-resistant resin (black)
Isolation: Input or alarm output to output 1 to output 2 to power
Overrange output: Approx. -15 to +115 % at 1 – 5 V
Zero adjustment: -5 to +5 % (front)
Span adjustment: 95 to 105 % (front)
Adjustable individually for each output 1 and output 2.
Alarm mode: High or Low
Alarm setpoint: -15 – +115 %
Alarm deadband: 0 – 20 %
Linearization: Max. 16 points
Input monitor LED: Red LED blinks according to the input.
Excitation adjustment: 5 – 24 V DC
Software programming: Programming Unit (model: PU-2x); (Refer to the users manual of JXCON for the adjustments configurable with JXCON)
• Input frequency range
• Zero and span
• Low-end cutout
• Linearization
• Alarm setpoint
• Output fine adjustment
• Averaging non-uniform pulses
• Others
Adjustments: With DIP and Rotary switches.
• Input Type
• Pulse Sensing
• Noise Filter
• Detecting level
(Refer to the instruction manual for details)
Modular jack: Connecting the PU-2x
Low-end cutout: -15 – + 115 % adjustable
(% of the input range determined by the input zero and span frequencies. This unit outputs 0 % for the input below the setting. When the input zero frequency is set to 0 Hz, the low-end cutout setting below 0 % is not valid.)

INPUT SPECIFICATIONS

Excitation: Shortcircuit protection; approx. 300 mA at shortcircuit
Frequency ranges: 0 – 0.01 Hz through 100 kHz (up to 10 Hz for mechanical contact)
Minimum pulse width time requirement: 5 μsec.; 50 msec. for mechanical contact (for both ON and OFF)
Minimum span: 10 % of the selected frequency range
■ **Open Collector & Mechanical Contact**
Input requirements
(Excitation: Sensing: OFF: ON)
5 V: Approx. 4 V / 1.0 mA: ≥ 200 kΩ: ≤ 200 Ω
12 V: Approx. 9 V / 2.3 mA: ≥ 200 kΩ: ≤ 200 Ω

24 V: Approx. 16 V / 4.7 mA: ≥ 200 kΩ: ≤ 200 Ω
Detecting level: 2 V (Detecting voltage in the internal circuit.)
Detecting pulse edge: OFF (input monitor LED ON) to ON (input monitor LED OFF)

■ **Voltage Pulse**
Waveform: Square or sine
Input impedance: 10 kΩ min.
Pulse amplitude: 0.1 – 100 Vp-p
Max. voltage between input terminals: 50 V
Detecting level: 0 – 5 V
(Detecting voltage in the internal circuit.)
Detecting pulse state: A pulse rise detected when the input voltage goes above the detecting level; a pulse sink detected when it goes below the level.

■ **Two-wire Current Pulse**
Input resistance: Receiving resistor 100 Ω
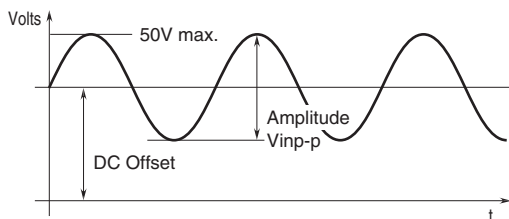**Input range**: 0 – 25 mA
Minimum pulse amplitude: 10 mA
Detecting level: 0 – 5 V
(Detecting voltage in the internal circuit.)
Detecting pulse state: The input resistor (100 Ω) converts the current signal into 0 – 2.5 V. A pulse rise detected when the voltage goes above the detecting level; a pulse sink detected when it goes below the level.

■ **Voltage pulse waveform**

OUTPUT SPECIFICATIONS

■ **DC Current**: 0 – 20 mA DC
Minimum span: 1 mA
Offset: Max. 1.5 times span
Load resistance: Output drive 12 V max. for Output 1;
7 V max. for Output 2
■ **DC Voltage**: -10 – +10 V DC
Minimum span: 10 mV
Offset: Max. 1.5 times span
Load resistance: Output drive 1 mA max.; at ≥ 0.5 V
■ **Alarm Output**: Relay contact
Rated load: 30V DC @ 1 A (resistive load)
Maximum switching voltage: 110 V DC
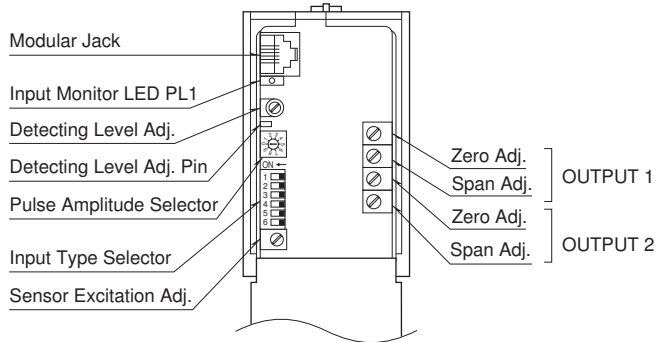**Maximum switching power**: 30 W
Minimum load: 10 mV DC @ 0.1 mA
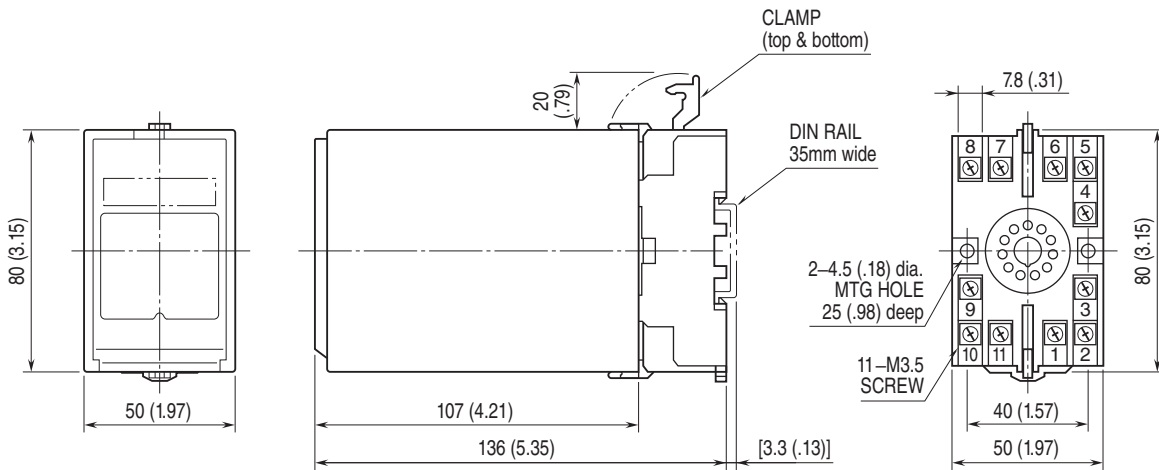**Mechanical life**: 5×10^7 cycles (180 cycles/minute)
For maximum relay life with inductive loads, external

protection is recommended.

INSTALLATION
Power input
•**AC**: Operational voltage range 85 – 132 V,
47 – 66 Hz, approx. 6.6 VA
•**DC**: Operational voltage range: Rating ±10 %, or 85 – 150 V for 110 V rating; ripple 10 %p-p max.; Approx. 3.9 W (145 mA at 24 V)
Operating temperature: -5 to +60°C (23 to 140°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 300 g (0.66 lb)

PERFORMANCE in percentage of span
Accuracy: Input accuracy + output accuracy
Input accuracy: ±0.05% of the selected freq. range
Inversely proportional to the input span.
[Example] Open collector input, 0 – 50 kHz
Selected Freq. Range 100 kHz ÷ Input Span 50 kHz × Accuracy 0.05 % + Output Accuracy 0.05 % = ±0.15 %
Output accuracy: ±0.05 % of the output range
Alarm setpoint accuracy: ±0.1 % (or ±0.2 % at ≥ 10 kHz)
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Response time: 0.5 sec. + 1 pulse cycle (0 – 90 %)
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 2000 V AC @1 minute
(input or alarm output to output 1 or output 2 to power to ground)
1000 V AC @ 1 minute (output 1 to output 2)

EXTERNAL VIEW

This unit is factory calibrated according to the Ordering Information. If you need to change hardware & software setting, refer to the instruction manuals of the transmitter and Programming Unit.
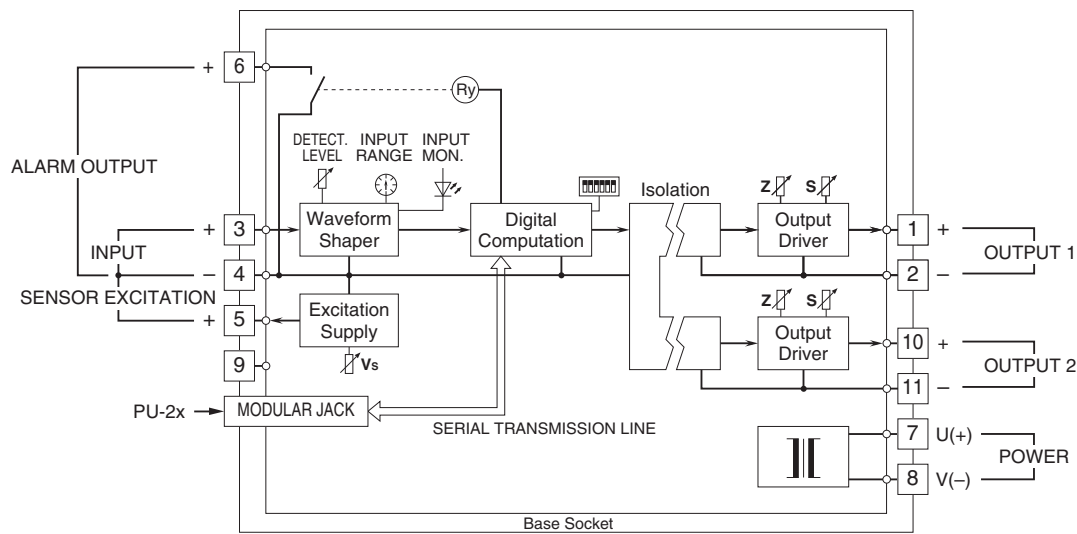

Modular Jack
Input Monitor LED PL1
Detecting Level Adj.
Detecting Level Adj. Pin
Pulse Amplitude Selector
Input Type Selector
Sensor Excitation Adj.

Zero Adj.
Span Adj. } OUTPUT 1
Zero Adj.
Span Adj. } OUTPUT 2

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

CLAMP
(top & bottom)

DIN RAIL
35mm wide

20 (.79)

80 (3.15)

50 (1.97)

107 (4.21)

136 (5.35)

[3.3 (.13)]

7.8 (.31)

80 (3.15)

2–4.5 (.18) dia.
MTG HOLE
25 (.98) deep

11–M3.5
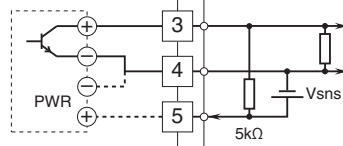SCREW

40 (1.57)

50 (1.97)

8 7 6 5 4 9 10 11 1 2 3

• When mounting, no extra space is needed between units.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

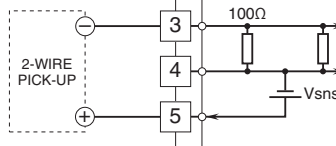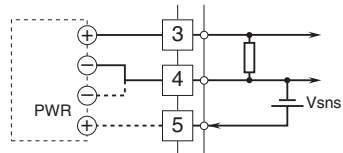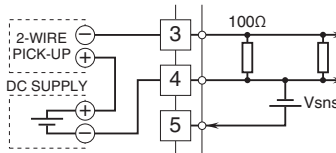**Input Connection Examples**

■ **Open Collector or Mechanical Contact**

■ **2-Wire Current Pulse**
•**Built-in Excitation**

■ **Voltage Pulse**

•**External DC Supply**

⚠ Specifications are subject to change without notice.